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U1S S1719 S1723 S1801 S1819 S1866 S2146

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GB 1447099 A GB 1397238 A GB 1245534 A
WO 96/03694 A1 US 4924462 A US 4245650 A

(58) Field of Search
UK CL (Edition O) **G4H HJ HNP**
INT CL⁶ **G08C**
ONLINE:WPI

(54) Communication system

(57) A communication system, for use with, for example, a distribution warehouse management system, comprises a central control station (C'), at least one remote operative station (O'), and means for transmitting voice and/or data information by wireless link (L') between the central control station (C') and remote operative station(s) (O') by means of a European Telecommunication Standard DECT radio transmission system.

A remote operative station (O') may include a scanning device (7), preferably a laser bar code scanner, which can be activated by means of a command signal transmitted over a low power radio link at the remote station (O'), resulting from DECT transmissions to and from the central control station (C') caused initially by a voice input command at the remote station (O').

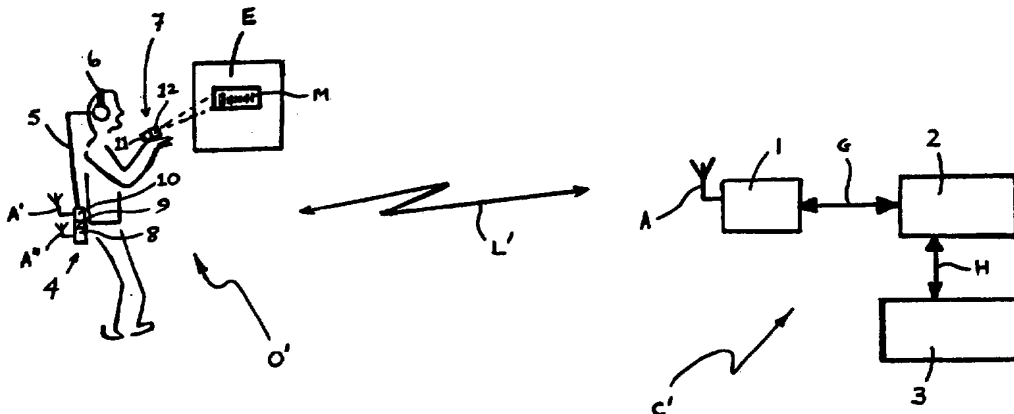


FIGURE 2

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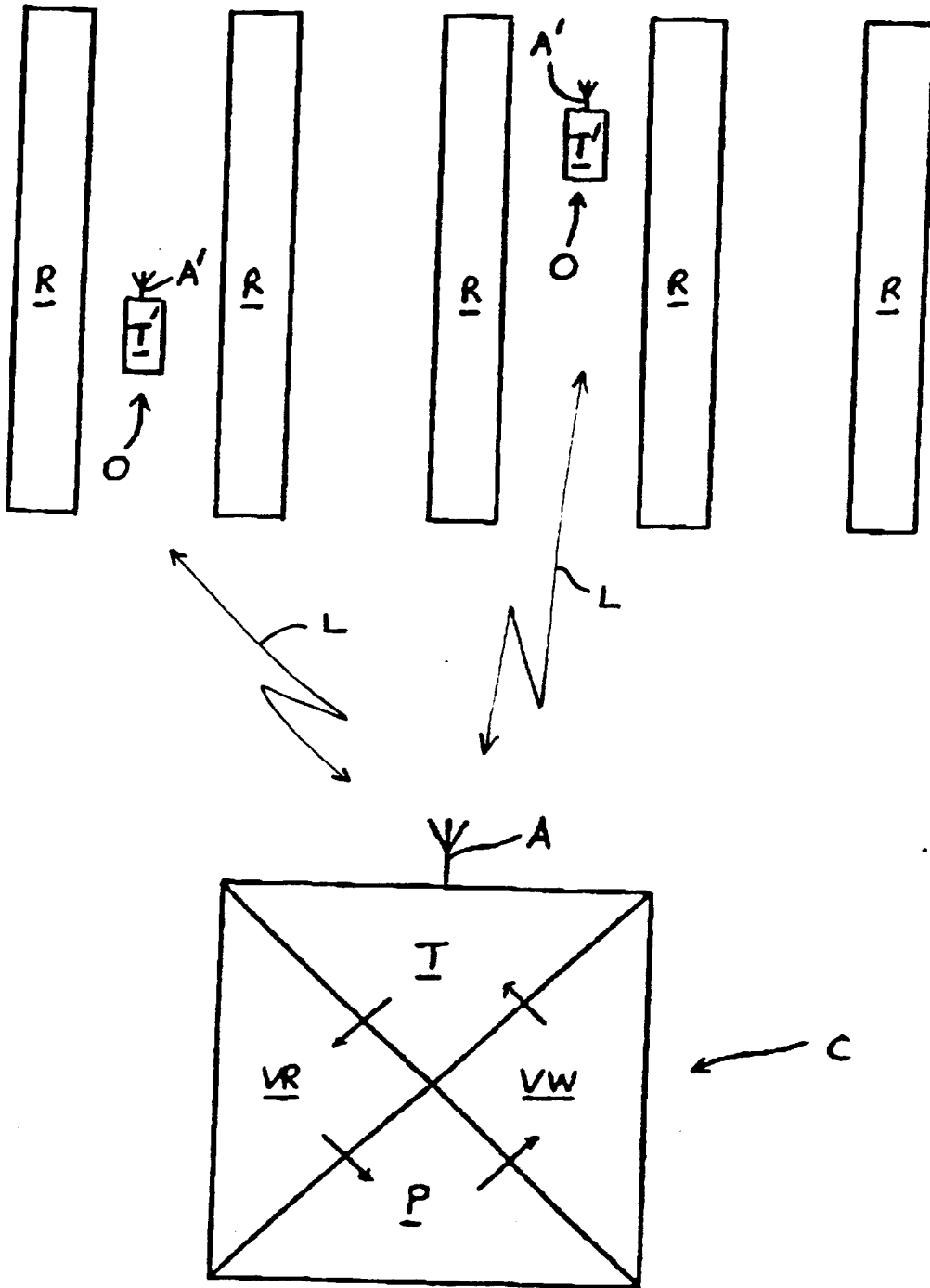


FIGURE 1

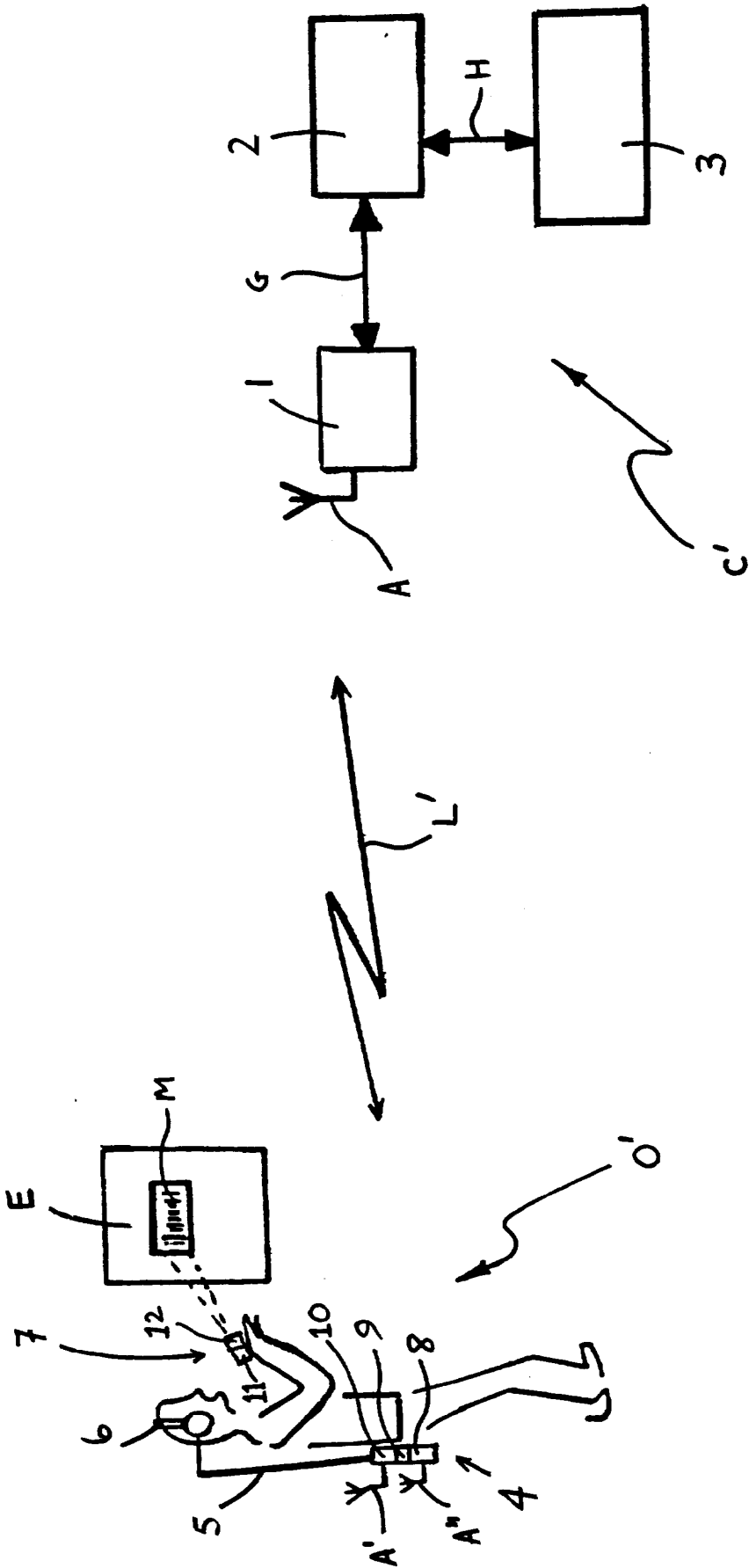


FIGURE 2

COMMUNICATION SYSTEMDESCRIPTION

5 This invention relates to a communication system in which information is transmitted back and forth between a control station and at least one station remote therefrom.

10 The invention is especially, but not exclusively, related to such a system when used as, or in conjunction with, a distribution warehouse management system wherein instructions and/or other information are is transmitted by wireless link, such as a radio
15 link, from a central control station to a remote operative station. Similarly, the remote operative station can transmit information by wireless link, such as a radio link, back to the central control station. Operation of the communication system of
20 the present invention relies upon the use of voice recognition techniques.

 In one known form of distribution warehouse management system of this type, instructions and/or
25 other information generated at the central control station either from a voice recording, for example a prerecorded vocabulary of spoken words, or by voice synthesiser, are/is transmitted to a remote operative station by radio. Those vocal instructions and/or
30 other information are addressed to an operative at the remote operative station via a speaker in, say, a headset worn by the operative. Vocal information spoken by the operative can be transmitted back to the central control station by radio via a microphone in
35 the operative's headset. Upon receipt of that vocal information by the central control station, a suitable

voice recognition system at that station converts the received vocal information into corresponding data for subsequent processing in, say, a computerised distribution/stock control system.

5

In this manner, the operative can work "hands-free" to carry out the tasks assigned to him.

10 The major disadvantage associated with this form of distribution warehouse management system is that the vocal information transmitted back and forth between the central control and remote operative stations, requires a comparatively broad bandwidth radio link, especially when multiple operatives
15 require simultaneous access to the central control station, which is generally unacceptable for the comparatively narrow, regulation operating bandwidths of localised radio transmission systems.

20 In another known type of distribution warehouse management system, instructions and/or other information are transmitted by radio as data information on a comparatively narrow bandwidth from the central control station to a remote operative
25 station at which the data information is synthesised or converted from say, a prerecorded vocabulary, into vocal instructions and/or other information which is then addressed to the operative via a headset. Vocal information from the operative is then converted into
30 data information by means of a voice recognition system carried by the operative, which is then transmitted back to the central control station at narrow bandwidth. Although this second type of system has its advantages over the first type of system
35 discussed above, in that it employs narrow bandwidth for the radio transmission of the data information,

the voice recognition system carried by the human operative is both cumbersome and "power hungry".

5 It is often necessary, in a distribution warehouse management system, to extract information from data relating to goods in storage locations and to pass that information to a central control station. For this purpose, the operative at the remote operative station may be required, from time to time, 10 to operate a scanning device, such as a laser scanner, and to relay results of the scan to the central control station. This requires "hands on" manoeuvres by the operative and other effort to relay the data information.

15 It is an object of the present invention to provide a communication system for use as, or in conjunction with, a distribution warehouse management system, which overcomes, or at least substantially 20 reduces, the disadvantages associated with the known types of distribution warehouse management systems discussed above.

25 The present invention provides, according to a first aspect thereof, a communication system comprising a control station, at least one station remote therefrom and means for transmitting vocal and/or data information by wireless link between the control station and said at least one remote station, 30 characterised in that said information transmissions back and forth between the control station and the or each remote station are effected by means of a DECT system as hereinafter defined.

35 The inventive system may include means arranged to convert vocal and/or data information transmitted

from the or each remote station to and received by the control station into data signals for subsequent processing at the control station.

5 Preferably, voice recognition means is located at the control station to receive vocal information transmitted thereto from the or each remote station. Such voice recognition means may be employed to convert the so-received vocal information into the
10 data signals for subsequent processing at the control station.

 Preferably, vocal information can be transmitted from the control station to the or each remote
15 station, which information may be generated at the control station by means of a voice synthesiser or from a pre-recorded vocabulary of spoken words.

 Preferably, also the or each remote station
20 includes a DECT system transceiver for transmitting and receiving information, such as vocal information, to and from the control station, the transceiver being connected, preferably, by a hard wire connection, to a headset which comprises at least a speaker and a
25 microphone and which may be worn by an operative.

 Throughout this specification, the term "DECT" (Digital Enhanced Cordless Telephony - formerly known as Digital European Cordless Telephony) refers to the
30 European Telecommunication Standard ETS 300 175, and is used to describe a transmission system employing a plurality of carrier frequencies using a time division multiple access (TDMA) system providing a plurality of duplex channels. For example, there may be ten
35 carrier frequencies, preferably in the 20 MHz bandwidth (usually between 1.88 and 1.90 GHz), and

twelve duplex channels. Thus, the control station of the DECT system may be capable of handling ten simultaneous transmissions, with 120 channels being available.

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Although the voice recognition means is preferably located at the control station where it may receive vocal transmissions from the or each remote operative station, for conversion into data signals for subsequent processing at the control station computer, such voice recognition means may be located at the or each remote station, in which case, vocal information generated at the or each remote station can be transmitted as data information from the or each remote station to the control station by means of the DECT system.

Although not preferred, the voice synthesiser or pre-recorded vocabulary may be located at the or each remote station, in which case, corresponding data information may be transmitted to the or each remote station from the control station using the DECT system, for subsequent conversion into vocal information by the voice synthesiser or pre-recorded vocabulary at the or each remote station.

Also, the invention extends to a distribution warehouse management system comprising a communication system in accordance with the first aspect of the invention, and, further, may extend to a method of operating such a distribution warehouse management system.

Accordingly, the present invention further provides, in accordance with a second aspect thereof, a method of operating a distribution warehouse

management system in which information, such as vocal
and/or data information, is transmitted by wireless
link between a control station and one or more
stations remote therefrom, wherein said transmissions
5 are effected by means of a DECT system as hereinbefore
defined.

Preferably, vocal information relating to
initiation of the operation of a scanning device at a
10 remote station can be transmitted from that remote
station to the control station, which, when received
at the control station, is processed thereat and
transmitted to that remote operative station as
corresponding data information which is effective to
15 cause the scanning device to perform a scanning
function.

Preferably also, respective vocal and data
information transmissions relating to initiation of
20 the operation of the scanning device between the
remote and control stations is again effected by means
of the DECT system.

In accordance with a third aspect of the
25 invention, there is provided a scanning device, such
as a bar code scanner, preferably of the laser type,
which is controllable, such as operable, to perform a
scanning function, by wireless link from a control
station.

30
The present invention further provides, in
accordance with a fourth aspect thereof, a
communication system comprising a control station, at
least one station remote therefrom and means for
35 transmitting information by wireless link between the
control station and said at least one remote station,

wherein said at least one remote station includes a scanning device whose operation is controllable by a wireless transmission from the control station.

5 Preferably, operation of the scanning device is initiated in response to a vocal command issued at the or each remote station, in which case, that command may be transmitted by the wireless link as vocal information to the control station.

10

 The scanning device of or included in either of the third and fourth aspects of the present invention, is preferably a laser scanner capable of reading coded information such as bar codes. Thus, the third and
15 fourth aspects of the present invention provide for operation of the scanning device, to read coded information, by, say, a remote radio link or other wireless link.

20

 Preferably also, a communication system according to the fourth aspect of the present invention further provides for vocal and/or data information transmissions between the control station and the or each remote station by means of a DECT system, as in
25 the case of the first aspect of the present invention. In this manner, a vocal command issued at a remote station can be transmitted as vocal information over the DECT system to voice recognition means at the control station where it is converted into a data
30 signal which is transmitted as data information from the control station to the appropriate remote station using the DECT system. The remote station may also include an auxiliary link, such as a radio link, preferably of low power, for transferring the data
35 information received at that station from the control station via the DECT system, to the scanning device in

the form of a command signal, to initiate operation of that device. Coded information read by the scanning device is, in turn, transmitted via that auxiliary link at the remote station for onward transmission as data information via the DECT system to the control station which further includes suitable means to receiving and processing that data information.

A suitable interface may be provided at the or each remote station between, say, the DECT system and auxiliary link for converting data information received via the DECT system from the control station into the command signal to be transmitted via, say, the auxiliary link to the scanning device.

Similarly, the or another interface may be provided at the or each remote station for converting or otherwise processing the coded information received from the scanning device via the auxiliary link into data information to be transmitted to the control station via the DECT system.

The auxiliary link at the remote operative station may comprise a transceiver, preferably of low power and operable at different frequencies to that of the DECT system, for receiving via, say, the interface data information as a command signal to be transmitted to the scanning device. Also the scanning device may comprise a similar transceiver for receiving the command signal and for transmitting coded information back to the first-mentioned transceiver from the scanning device. That first-mentioned transceiver may, thus, receive that coded information which can be converted or otherwise processed by, say, the interface into data information for transmission from the remote operative station to the control station

via the DECT system.

Any such interface may be located between the first-mentioned transceiver of the auxiliary link and
5 any DECT transceiver at the or each remote operative station.

The present invention further provides, according to a fourth aspect thereof, a method of operating a
10 scanning device from a control station, comprising transmitting from the control station by a wireless link a signal to effect operation of the scanning device.

15 In order that the invention may be more fully understood, preferred embodiments of distribution warehouse management systems in accordance therewith will now be described by way of example and with reference to the accompanying drawings in which:

20 Figure 1 is a diagrammatic representation of a first distribution warehouse and associated communication system; and

25 Figure 2 is a diagrammatic representation of a second distribution warehouse and associated communication system.

Referring firstly to Figure 1, a central control
30 station, indicated generally at C, is able to communicate with a plurality (only two shown) of remote operative stations O, via a wireless link L, such as a radio link, by means of a transceiver T and antenna A, employing a DECT system as hereinbefore
35 defined.

Each remote operative station O is carried by an operative and includes a transceiver T', antenna A' and a headset (not shown) worn by the operative and comprising an ear speaker and a microphone (also not shown). Each operative has the task of removing goods from racking R in the warehouse to make up orders which are transmitted to him from the central control station C by way of vocal instructions and/or other information generated from either a prerecorded vocabulary of spoken words or a voice synthesiser VW on receipt of suitable data signals from a central processor P. Appropriate vocal instructions from the human operative are transmitted by the radio link to the central control station C, which instructions are received by the transceiver T via the antenna A, communicated to a voice recognition unit VR and converted into data signals which are then passed to the processor P. The radio transmissions, in both directions, between the central control station C and the or each remote operative station O are effected using a DECT system, in accordance with the invention.

Once the vocal and/or other information has been transmitted to the remote operative station O from the central control station C and the operative has either responded to that vocal information by removing the requisite goods from the racking to complete an order or carried out other tasks in accordance with alternative and/or additional vocal information received through his headset, he then speaks into his headset and the appropriate confirmatory vocal information is then transmitted by the transceiver T' via the antenna A', by the radio link L, to the central control station C where it is received by the transceiver T via the antenna A and then converted by the voice recognition unit VR into data signals which,

in turn, are inputted to the processor P.

5 With reference now to Figure 2, a communication system according to the present invention comprises a central control station, indicated generally at C', which is able to communicate with a plurality (only one shown) of remote operative stations O', via a radio or other wireless link(s) L' employing a DECT system as hereinbefore defined. The central control station C' comprises a DECT base station 1 having, again, an antenna A, a voice recognition system 2 and an application computer 3, these being appropriately interlinked for two way exchange as indicated diagrammatically by the double-headed arrows G and H.

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The remote operative station O' is intended to be carried by an operative and includes a unit 4 which is preferably mountable on a belt around the operative and which contains two radio transceivers 8, 10 interconnected by a suitable interface shown diagrammatically at 9.

20

Of these two transceivers, one is a DECT system transceiver 10 similar to that described in relation to the embodiment of Figure 1 above, also having an associated antenna A', and able to transmit and receive vocal and/or data information to and from the central control station C'. Transmissions back and forth between the remote operative station O', by means of this DECT transceiver 10, and the central control station C' are DECT system transmissions which are made in a similar fashion to those described above in relation to the embodiment of Figure 1. The unit 4 is self-contained and includes its own battery.

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The other of the two transceivers contained

within the unit 4 is a low power radio transceiver 8 having an associated antenna A''. This transceiver 8 is capable of receiving data information, processed by the interface 9, from the central control station C',
5 as will be explained in greater detail below, and of transmitting a command signal, on a different frequency from that used by the DECT system, to a low power radio transceiver 11 included in a bar code scanner 7 whose associated transceiver 11, and
10 operating battery (not shown) are combined into a self-contained, cordless, lightweight unit mounted or mountable on, or adjacent, the wrist or hand of the operative, so that the operative may function in a "hands free" manner irrespective of the presence of
15 the scanner 7.

The scanner unit 7 preferably comprises a laser bar code reader 12 of a type well known in the art and capable, upon being initiated by receipt of the low
20 power command signal, of emitting a beam of laser radiation which, upon modulation by a bar code M printed on a label E to be read, derives the data of the bar code. By its associated transceiver 11, the bar code data is transmitted via the low power radio
25 link to the transceiver 8 contained within the unit 4. This transceiver 8 then transfers the bar code data to the DECT transceiver 10 via the processing interface 9, which then transmits the so-processed data information to the central control station C' via the
30 DECT system for appropriate and subsequent processing.

In operation, when the operative at the remote operative station O' wishes to initiate operation of the scanner 7 for the purpose of scanning the bar code
35 M on the label E, the operative speaks a special trigger word, for example "SCAN", and that vocal

information is transmitted by the DECT transceiver 10 over the DECT system to the central control station C' where it is processed by the voice recognition system 2 and thus decoded and recognised as the special trigger word required to activate the scanner 7. In response, the central control system C' transmits corresponding data information over the DECT system to the belt DECT transceiver 10 of the mounted unit 4. This data information is decoded by the interface 9 and passed to the low power radio transceiver 8 also contained within the unit 4. This transceiver 8 then transmits a corresponding command signal to the low power radio transceiver 11 of the scanner 7. In response, operation of the scanner 7 is initiated and as a result the scanner 7 emits a beam of optical radiation to read the bar code M at which the scanner 7 is pointed by the operative. The data of the so-read bar code M is transmitted by the low power radio transceiver 11 of the scanner 7 to the low power radio transceiver 8 contained within the belt-mounted unit 4. Within this unit 4, the interface 9 converts the bar code data to DECT format and the associated DECT transceiver 10 transmits the resultant data information over the DECT system to the central control station C', where that information is received and suitably processed.

The communication system of the present invention, in using voice communication between the central control station and the operative at the or each remote operative station, employs the most natural form of communication. The system is, therefore, more "user-friendly" than a system employing a computer screen and/or keyboard which might intimidate an operative and/or hamper working practices.

Further, communication systems of the present invention allow for one or more remote, mobile operatives to operate hands free in a given geographical area (for example an individual warehouse or factory) whilst communicating in real time with a control station.

In this specification, vocal and data information transmissions are wireless transmissions in digital form. Thus, the control station operates with a combination of digital RF communications technology, non-synthesised voice prompting and computer software which provides an easy-to-use interface to an existing or proposed computer system. The system may include a host computer interface in any of a number of forms suited to attaching the system to the, or a selected, computer system.

A voice recognition system in a communication system in accordance with the present invention can handle all the speech (voice) processing and uses speaker-independent technology allowing various accents, both male and female, and many languages to be recognised without tedious enrolment procedures.

The or each remote operative station in a communication system in accordance with the present invention allows the human operative completely "hands free" operation and full mobility. The or each such remote station may also provide a fully functioning cordless telephone allowing ad-hoc conversations with other operatives, supervisors and others.

The control station in a communication system in accordance with the present invention may include one or more wall-mounted RF concentrator(s) capable of

providing a link to all the mobile operatives operating in its or their vicinity. These RF concentrators operate in cellular fashion so that as the mobile operative moves outside the range of one he is "seamlessly" handed over to another. All communications are encrypted to prevent unauthorised eavesdropping. Each such RF concentrator is cabled or otherwise connected to a central control point.

Thus, it is to be appreciated that the inventive distribution warehouse management system using a DECT communication system, as hereinbefore defined, can provide multiple, simultaneous, duplex, roaming access to a central control station (computer), together with low cost, lightweight mobile units, thereby yielding a more technically elegant solution than the previously-known systems described above.

It will also be appreciated that the inventive system provides for activation of a remote scanning device over a wireless, such as a radio, link and, moreover, by means of voice activation. Because the low power auxiliary radio link employs a different frequency to that of the main DECT system, there is no interference between the two systems, and because an operative can continue working in a "hands free" manner, merely issuing appropriate voice scan commands as required, the system of the present invention significantly enhances operative efficiency.

Whilst the present invention has been described above in relation to its application to a distribution warehouse management system, its scope is not to be limited thereby but is to extend to all variants and alternative applications as are embraced within the broadest statement contained herein of the present

invention. Alternative applications envisaged include, for example, field service engineering, delivery tracking, traffic management, airport baggage control, security systems, vehicle inspection, meter reading.

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CLAIMS

1. A communication system comprising a control station and at least one station remote therefrom and, means for transmitting vocal and/or data information by wireless link between the control station and said at least one remote station, characterised in that said information transmissions back and forth between the control station and the or each remote station are effected by means of a DECT system as hereinbefore defined.
2. A communication system according to claim 1 including means arranged to convert vocal and/or data information transmitted from said at least one remote station to and received by the control station into data signals for subsequent processing at the control station.
3. A communication system according to claim 1 or 2 including voice recognition means located at the control station and arranged to receive vocal information transmitted thereto from said at least one remote station.
4. A communication system according to claim 3, wherein said voice recognition means is arranged to convert the so-received vocal information into data signals for subsequent processing at the control station.
5. A communication system according to any preceding claim, wherein the control station includes a voice synthesiser or pre-recorded vocabulary for generating vocal information to be transmitted to said at least one remote station.

6. A communication system according to any proceeding claim, wherein the control station includes a DECT system transceiver.

5 7. A communication system according to any preceding claim, wherein said at least one remote station includes a DECT system transceiver for transmitting and receiving vocal and/or data information to and from the control station.

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8. A communication system according to claim 7, wherein said at least one remote station includes a headset connected to the DECT system transceiver at said at least one remote station.

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9. A communication system according to claim 8, wherein the headset at said at least one remote station is connected to the DECT system transceiver at that station by a hard wire connection.

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10. A communication system according to claim 8 or 9, wherein the headset comprises at least a speaker and a microphone and is capable of being worn by an operative.

25

11. A communication system according to any preceding claim, wherein said at least one remote station includes voice recognition means and is arranged to transmit vocal information generated at said station, as data information, to the control station.

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12. A communication system according to any preceding claim, wherein said at least one remote station includes a voice synthesiser or pre-recorded vocabulary for generating vocal information thereat from data information transmitted thereto from the

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control station.

5 13. A communication system according to any preceding claim, wherein said at least one remote station includes a scanning device operable to perform a scanning function by a wireless link from the control station.

10 14. A communication system according to claim 13, wherein the wireless link from the control station to the scanning device is effected within the DECT system.

15 15. A communication system according to claim 13 or 14, wherein said at least one remote station includes means arranged to transmit vocal information to the control station for initiating operation of the scanning device.

20 16. A communication system according to any of claims 13 to 15, wherein the control station is arranged to transmit data information to said at least one remote station to initiate operation of the scanning device.

25 17. A communication system according to any of claims 13 to 16, wherein said at least one remote station includes an auxiliary link for transmitting a command signal to the scanning device to initiate operation thereof on receipt of data information transmitted
30 from the control station to said at least one remote station via the wireless link.

35 18. A communication system according to claim 17, wherein the auxiliary link at said at least one remote station comprises a first transceiver connected to a DECT transceiver via an interface therebetween.

19. A communication system according to claim 17 or 18, wherein the auxiliary link comprises a second transceiver associated with the scanning device.

5 20. A communication system according to claim 19, wherein the first transceiver is arranged to transmit the command signal to the second transceiver to initiate operation of the scanning device.

10 21. A communication system according to claim 19 or 20, wherein the second transceiver is arranged to transmit to the first transceiver coded information read by the scanning device during operation thereof.

15 22. A communication system according to claim 21 wherein the first transceiver is arranged to transfer the so-received coded information to the DECT transceiver for onward transmission as data information to the control station.

20 23. A communication system according to any of claims 13 to 22, wherein the scanning device comprises a bar code scanner.

25 24. A distribution warehouse management system comprising a communication system according to any preceding claim.

30 25. A method of operating a distribution warehouse arrangement system in which vocal and/or data information is transmitted by a wireless link between a control station and at least one station remote therefrom wherein said transmissions are effected by means of a DECT system as hereinbefore defined.

35 26. A communication system comprising a control

station, at least one station remote therefrom and means for transmitting information by wireless link between the control station and said at least one remote station, wherein said at least one remote station includes a scanning device whose operation is controllable by a wireless transmission link from the control station.

27. A communication system according to claim 26, wherein operation of the scanning device to perform a scanning function can be initiated in response to a vocal command issued at said at least one remote station.

28. A communication system according to claim 27, wherein the vocal command issued at said at least one remote station, can be transmitted by the wireless link as vocal information to the control station.

29. A communication system according to claim 26, 27 or 28, wherein said at least one remote station includes an auxiliary link between the wireless transmission link with the control station and the scanning device.

30. A communication system according to claim 29, wherein the auxiliary link comprises a radio or other wireless link.

31. A communication system according to claim 29 or 30, wherein the scanning device is arranged to transmit via the auxiliary link coded information read by the scanning device during operation thereof to the wireless link for onward transmission thereby to the control station as data information for subsequent processing thereby.

32. A communication system according to any of claims
29 to 31, wherein said at least one remote station
includes an interface between the wireless and
auxiliary links, for converting data information
5 received from the control station via the wireless
link into a command signal to be transmitted to the
scanning device via the auxiliary link.

33. A communication system according to any of claims
10 29 to 32, wherein said at least one remote station
includes an interface between the wireless and
auxiliary links, for converting or otherwise
processing coded information received from the
scanning device via the auxiliary link into data
15 information to be transmitted to the control station
via the wireless link.

34. A communication system according to claim 32 or
33, wherein said at least one remote station includes
20 a transceiver for receiving via the interface data
information from the control station via the wireless
link as the command signal to be transmitted to the
scanning device via the auxiliary link.

35. A communication system according to claim 34,
25 wherein the transceiver is arranged to receive coded
information from the scanning device via the auxiliary
link for transmission via the interface as data
information to the control station via the wireless
30 link.

36. A communication system according to any of claims
29 to 35, wherein the scanning device at said at least
one remote station includes a transceiver for
35 receiving a command signal via the auxiliary link and
for transmitting coded information from the scanning

device to the wireless link for transmission as data information to the control station.

5 37. A communication system according to any of claims 26 to 36, wherein the wireless transmission link between the control station and said at least one remote station is operable as a DECT system as hereinbefore defined.

10 38. A communication system according to claim 37 when dependent upon any of claims 30 to 36, wherein the auxiliary radio or other wireless link is operable on a different frequency to that of the DECT system.

15 39. A communication system according to claim 37 or 38, wherein the vocal command issued at said at least one remote station to initiate operation of the scanning device, is transmitted to the control station via the DECT system as vocal information.

20 40. A communication system according to claim 39, wherein the control station includes voice recognition means for processing the vocal command, which is received from said at least one remote station as
25 vocal information, into data information for transmission to said remote station, to initiate operation of the scanning device.

30 41. A scanning device arranged to be controlled, to perform a scanning function, by a wireless link from a control station.

35 42. A scanning device according to claim 41 including means arranged to receive a command signal from a control station via the wireless link, to initiate operation of the device to perform a scanning

function.

43. A scanning device according to claim 41 or 42 including means arranged to transmit coded
5 information, derived from a scanning function during operation of the device, to the control station via the wireless link.

44. A scanning device according to claim 42 or 43,
10 wherein said command signal receiving means and/or said coded information transmission means, as the case may be, comprises a transceiver.

45. A scanning device according to any of claims 41
15 to 44, including means arranged to secure the device detachably to an operative.

46. A scanning device according to any of claims 41
to 45 comprising a bar code scanner.

20

47. A scanning device according to any of claims 41 to 46 further including means arranged to provide "hands free" operation when worn by an operative.

25 48. A DECT communication system substantially as hereinbefore described with reference to the accompanying drawings.

49. A distribution warehouse management system
30 substantially as hereinbefore described with reference to the accompanying drawings.

50. A scanning device substantially as hereinbefore described with reference to the accompanying drawings.

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Application No: GB 9620710.5
Claims searched: 1-25,48,49

Examiner: Mike Davis
Date of search: 13 November 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): G4H (HNP,HJ)

Int CI (Ed.6): G08C

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	None	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



Application No: GB 9620710.5
Claims searched: 26-47,50

Examiner: Mike Davis
Date of search: 13 November 1996

Patents Act 1977
Further Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): G4H (HNP,HJ)

Int CI (Ed.6): G08C

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 1447099 (PLESSEY)	26,41 at least
X	GB 1397238 (PLESSEY)	"
X	GB 1245534 (MARCONI)	"
X	WO 96/03694 A1 (PSC)	"
X	US 4924462 (SOJKA) e.g. column 2 lines 35-66	"
X	US 4245650 (WELKER ET AL) e.g. column 2 lines 12-40	"

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
& Member of the same patent family

A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.